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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,161	07/23/2003	Jeong-Hwan Song	5000-1-414	8002
33942	7590	02/11/2005	EXAMINER	
CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			LEPISTO, RYAN A	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,161

Applicant(s)

SONG ET AL

Examiner

Ryan Lepisto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d) prior to declaration of an interference, a translation of the foreign application should be submitted under 37 CFR 1.55 in reply to this action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-3, 7-10 and 14-16** are rejected under 35 U.S.C. 102(e) as being anticipated by **Lazaro Villa (US 2003/0123799 A1)** (Lazaro). Lazaro teaches an athermal arrayed waveguide grating (AWG) (Fig. 1) and the inherent method of its formation comprising a substrate (12), input waveguides (141...14n) formed extending across the substrate (2) for inputting multiple optical signals, a grating array (201...20k) formed for separating the input optical signals into different light wavelengths, a first slab formed having a first and second layer (23, 24) with different indices from each other for coupling the input waveguide with the grating array (paragraph 0041) wherein

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the refractive index of layer (24) is different than the refractive index of the array grating (201...20k) extending across the substrate (12) and input waveguides (141... 14n) (the input, grating and slab 23 are all "glass parts" paragraph 0041), a second slab (18) formed for causing the different light wavelengths from the grating array (201...201k) to be imaged on an egress surface (part of 18) and an output waveguide array (221...22m) extending across the substrate (12) for outputting the light imaged on the egress surface (part of 18) of the second slab (18) in a form of a separated channel (paragraphs 0011-0021 and 0040-0045).

With regard to claims 2 and 3, Lazaro teaches an alternate embodiment of the first slab waveguide shown in Fig. 3, which shows a first layer (324) connected to the input waveguides (141... 14n) wherein the first layer (324) has a different refractive index than the input waveguides (the waveguides are "glass parts" and first layer is a "polymer part" paragraphs 0041 and 0050). Fig. 3 also shows that the second layer (323) interposed between the first layer (324) and the grating array (201...20k) as another "glass part" (paragraph 0041 teaches that the waveguides are glass parts unless specifically told otherwise) the second layer (323) will have the same refractive index as the input waveguides ("glass parts" 141... 14n).

Note claims 8 and 16 (nor claims 1 and 14 that they depend on) does not place the two layers in any particular place or orientation in the first slab waveguide, so Lazaro reads upon these claims when layer (24) is taken as the "first" layer and layer (23) is taken as the "second" layer as in claims 8 and 16 or as taken as the first layer

being next to the input waveguides and the second layer being next to the array grating as in the alternate embodiment of Fig. 3 as described above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 6, 13 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lazaro.

Lazaro teaches the AWG with the limitations described above used to reject claims 1-3, 7-10 and 14-16.

Lazaro does not teach expressly the first layer of the first slab having a length of 21.07 μm in a direction in which the optical signal travels.

At the time the invention was made, it would be obvious to a person of ordinary skill in the art to have a length for the first layer of about 21.07 μm in that this is a dimension that is typical in known AWG. Applicant has not disclosed that an exact length of 21.07 μm provides an advantage, is used for a particular purpose, or solves a stated problem over say, 21.03 μm or any dimension well known in the art. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with AWG with the differing refractive index layer as taught by Lazaro because it will

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efficiently and cheaply create an AWG with temperature compensating properties, low loss and low crosstalk penalties (paragraph 0011).

Therefore, it would have been obvious to one of ordinary skill in this art to modify Lazaro to obtain the invention as specified in claims 6, 13 and 19.

The motivation would have been to create an AWG that is suitable for mass production and has a low loss and crosstalk penalties (paragraph 0011).

4. **Claims 4, 11 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lazaro and **Terada et al (US 4,812,012)** (Terada).

Lazaro teaches the AWG with the limitations described above used to reject claims 1-3, 7-10 and 14-16.

Lazaro does not teach expressly a layer of material in the first slab waveguide having a refractive index of 1.415.

Terada teaches materials used in forming optical waveguides, where one is a polymer, polyfluoromethacrylate having a refractive index of 1.415 (column 6 lines 63-64).

Lazaro and Terada are analogous art because they are from the same field of endeavor, optical systems using polymer optical waveguide materials.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the polymer as taught by Terada for the "polymer part" layer as taught by Lazaro since Lazaro teaches only that any polymer that is useful in an optical system would suffice for the "polymer part" (paragraph 0041).

The motivation for doing so would have been to increase efficiency in the AWG by using material know to produce waveguides capable of performing at high speeds and accuracy (Terada, column 7 line 20 through column 8 line 4).

5. **Claims 5, 12 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lazaro and **Yoneda (US 2003/0021567 A1)** (Yoneda).

Lazaro teaches the AWG with the limitations described above used to reject claims 1-3, 7-10 and 14-16.

Lazaro does not teach expressly a layer of material in the first slab waveguide having a refractive index of 1.46.

Yoneda teaches an AWG (Fig. 10) with a substrate (203) with waveguides formed of the substrate where the layer is a glass Si substrate with refractive index of 1.46 (paragraph 0086).

Lazaro and Yoneda are analogous art because they are from the same field of endeavor, AWGs with glass a glass Si layer with waveguides.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Si glass as taught by Yoneda for the "glass part" layer as taught by Lazaro since Lazaro teaches only that any glass part that is useful in an optical system would suffice for the "glass part" (paragraph 0041) and since Si is a well know glass widely used in the art at the time of the invention.

The motivation for doing so would have been to increase efficiency in the AWG by using materials that will suppress the fluctuations of characteristics of optical waveguides elements due to temperature changes (Yoneda, abstract).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. All of the following references teach AWGs with first slab waveguides with sections of differing refractive index materials: Yamauchi et al (EP 1406099 A2), Cheben et al (US 2004/0151459 A1), Yamauchi et al (US 2004/0170355 A1), He et al (US 6,169,838 B1), Nakagawa et al (US 6,807,354 B2), Ide (US 2003/0118284 A1), Parker et al (US 6,735,368 B2).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ryan Lepisto

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Date: 2/7/05



Frank Font

Supervisory Patent Examiner

Technology Center 2800